

Figure 1

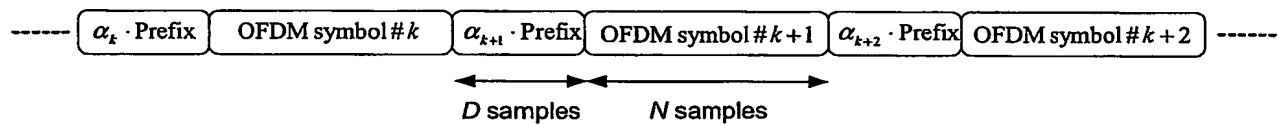


Figure 2

Diagram illustrating the structure of the channel impulse response matrix H_{IBI} .

The matrix is defined by the following structure:

$$= [H_{IBI}] = \begin{pmatrix} 0 & \rightarrow & 0 & h_{D-1} & h_{D-2} & \rightarrow & h_1 \\ \downarrow & \searrow & \searrow & \searrow & h_{D-1} & \searrow & h_2 \\ \downarrow & \searrow & \searrow & \searrow & \searrow & \searrow & \downarrow \\ \downarrow & \searrow & \searrow & \searrow & \searrow & \searrow & h_{D-1} \\ \downarrow & \searrow & \searrow & \searrow & \searrow & \searrow & 0 \\ \downarrow & \searrow & \searrow & \searrow & \searrow & \searrow & \downarrow \\ 0 & \searrow & \searrow & \searrow & \searrow & \searrow & 0 \end{pmatrix}$$

Figure 3

$$= [H_{ISL}] = \begin{pmatrix} h_0 & 0 & \rightarrow & \rightarrow & \rightarrow & \rightarrow & 0 \\ h_1 & \searrow & \searrow & \searrow & \searrow & \searrow & \downarrow \\ \downarrow & \searrow & \searrow & \searrow & \searrow & \searrow & \downarrow \\ h_{D-2} & \searrow & \searrow & \searrow & \searrow & \searrow & \downarrow \\ h_{D-1} & \searrow & \searrow & \searrow & \searrow & \searrow & \downarrow \\ 0 & \searrow & \searrow & \searrow & \searrow & \searrow & 0 \\ 0 & \searrow & \searrow & h_{D-1} & h_{D-2} & \rightarrow & h_0 \end{pmatrix}$$

Figure 4

$$= [H_{IBL}] + [H_{ISL}] = \begin{pmatrix} h_0 & 0 & \rightarrow & h_{D-1} & h_{D-2} & \rightarrow & h_1 \\ h_1 & \searrow & \searrow & \searrow & h_{D-1} & \searrow & h_2 \\ \downarrow & \searrow & \searrow & \searrow & \searrow & \searrow & \downarrow \\ h_{D-2} & \searrow & \searrow & \searrow & \searrow & \searrow & h_{D-1} \\ h_{D-1} & \searrow & \searrow & \searrow & \searrow & \searrow & 0 \\ 0 & \searrow & \searrow & \searrow & \searrow & \searrow & \downarrow \\ 0 & \searrow & \searrow & h_{D-1} & h_{D-2} & \rightarrow & h_0 \end{pmatrix}$$

Figure 5

$$[H] = \begin{pmatrix} h_0 & \rightarrow & h_2 & h_1 \\ h_1 & \searrow & h_3 & h_2 \\ \downarrow & \searrow & \searrow & \downarrow \\ h_{D-1} & \rightarrow & h_1 & h_0 \end{pmatrix}$$

Figure 6

$$\boxed{H_1} = \begin{pmatrix} 0 & h_{D-1} & \rightarrow & h_2 & h_1 \\ 0 & \searrow & \searrow & h_3 & h_2 \\ \downarrow & \searrow & \searrow & \searrow & \downarrow \\ \downarrow & \searrow & \searrow & \searrow & h_{D-1} \\ 0 & \searrow & \searrow & 0 & 0 \end{pmatrix}$$

Figure 7

$$\boxed{H_0} = \begin{pmatrix} h_0 & 0 & \rightarrow & \rightarrow & 0 \\ h_1 & h_0 & 0 & \searrow & \downarrow \\ \downarrow & \searrow & \searrow & \searrow & \downarrow \\ \downarrow & \searrow & \searrow & \searrow & 0 \\ h_{D-1} & h_{D-2} & \rightarrow & \rightarrow & h_0 \end{pmatrix}$$

Figure 8

$$\begin{bmatrix} r_0(k) \\ r_1(k) \\ r_2(k) \\ r_3(k) \\ r_4(k) \end{bmatrix} = \begin{bmatrix} & & & h_{D-1} & h_1 \\ & & & \boxed{H_1} & \\ & & & & \\ & & & & \\ & & & & \end{bmatrix} \cdot \begin{bmatrix} x_0(k-1) \\ x_1(k-1) \\ x_2(k-1) \\ x_3(k-1) \\ x_4(k-1) \end{bmatrix} + \begin{bmatrix} h_0 & & & & \\ h_{D-1} & \boxed{H_0} & & & \\ & \boxed{H_1} & \boxed{H_0} & & \\ & & \boxed{H_1} & \boxed{H_0} & \\ & & & \boxed{H_1} & \boxed{H_0} \end{bmatrix} \cdot \begin{bmatrix} x_0(k) \\ x_1(k) \\ x_2(k) \\ x_3(k) \\ x_4(k) \end{bmatrix} = \begin{bmatrix} h_0 & & & & \\ h_{D-1} & \boxed{H_0} & & & \\ & \boxed{H_1} & \boxed{H_0} & & \\ & & \boxed{H_1} & \boxed{H_0} & \\ & & & \boxed{H_1} & \boxed{H_0} \end{bmatrix} \cdot \begin{bmatrix} x_0(k) \\ x_1(k) \\ x_2(k) \\ x_3(k) \\ x_4(k) \end{bmatrix}$$

$\xleftarrow{\quad [H_{IBI}] \cdot x(k-1) \quad} \quad \xleftarrow{\quad [H_{IBI}] \cdot x(k) \quad}$

Figure 9

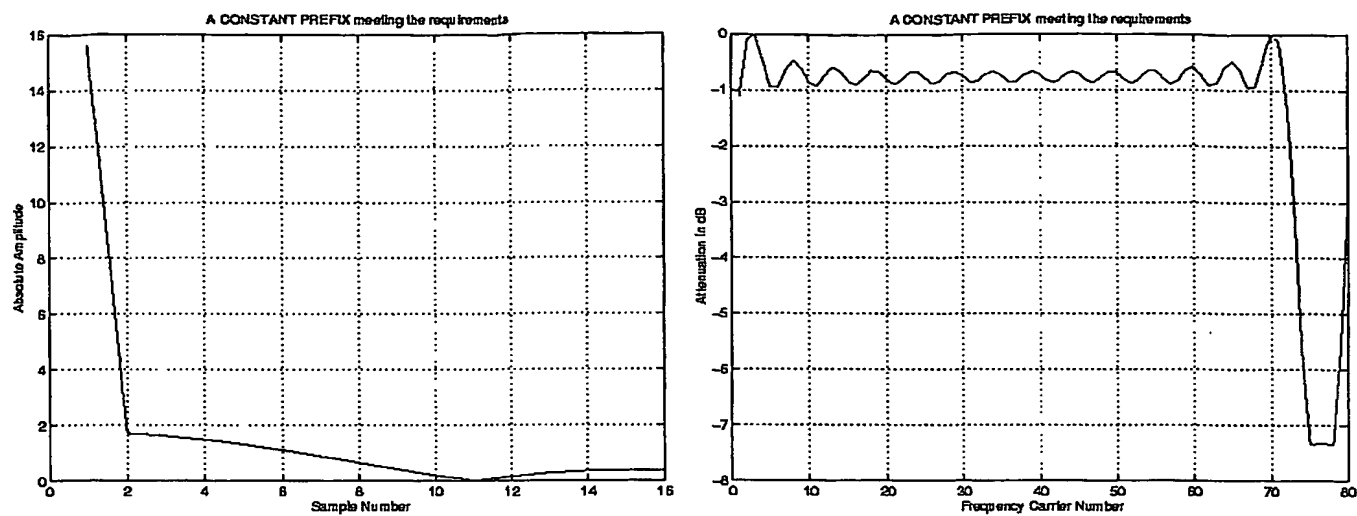


Figure 12